DUKE ENERGY.

139 E. Fourth Street, EM740
Cincinnati, Ohio 45202

December 9, 2016

VIA OVERNIGHT DELIVERY

Kevin M. Pierard, Chief
NPDES Programs Branch, WN-16J
Water Division
U.S. Environmental Protection Agency, Region 5
77 W. Jackson Boulevard
Chicago, IL 60604-3590

Re: Response to Request for Additional Information –
Fundamentally Different Factors Variance Application for Duke Energy Indiana, LLC –
Edwardsport IGCC Generating Station (NPDES Permit IN0002780)

Dear Mr. Pierard:

The following information is provided in response to your letter dated November 18, 2016, requesting additional information from Duke Energy Indiana, LLC (Duke Energy) relating to its pending application for a fundamentally different factors variance from the recently adopted effluent limitations guidelines (ELGs) for the Steam Electric Power Generating Point Source Category. The four specific requests for information identified in your letter are reiterated below, followed by Duke Energy's responses.

Request No. 1

All analytical data for arsenic, mercury, selenium, TDS, and any other pollutants, for the time period of May 2013 through the present (along with associated laboratory reports) for each of the wastestreams listed below. . . .

a. Grey water treatment system influent;
b. Concentrator condensate;
c. Crystallizer steam condensate;
d. Crystallizer process condensate;
e. Barometric condenser condensate;
f. Condensate trim cooler (combined condensate); and
g. Final greywater treatment effluent (Outfall 501).

Response

Attached, please find a spreadsheet summarizing the available analytical data for the grey water treatment system for the time period of May 2013 to present. The contract lab reports supporting this data, consisting of multiple PDF-format files, have been copied to an enclosed flash drive. Individual PDF files on the flash drive have been named to match the applicable sample date as shown on the spreadsheet (e.g., "2015-09-08 Mercury.pdf"). At this time, we have been unable to locate the lab reports for two early sampling dates (5/9/2013 and 8/25/2013), from the period of IGCC startup. We are continuing to search for these reports and will provide them if located.

While gathering the requested information, we have belatedly become aware that Edwardsport operating personnel collect additional analytical data (e.g., pH and solids) from within the grey water treatment

system for process control purposes. Some of this data may correspond to wastewater sampling locations identified by EPA above as within the scope of Request No. 1. At this time, it is unclear but doubtful that this data has been obtained through EPA-approved methods or has been subject to NPDES-appropriate quality control procedures. Consequently, though technically within the scope of requested information, Duke Energy doubts its utility for EPA in its review of the FDF variance application. In order to meet EPA's voluntary submission deadline of 12/12/2016, this process control data has not been assembled or included with this submission.

Request No. 2

Please provide the following flow rate information in an Excel spreadsheet:

a. Maximum design flow rate for all wastestreams identified in request number 1.
b. Average design flow rate for all wastestreams identified in request number 1.
c. Average daily flow rate for the sample collection date(s) for all analytical data included in Appendix 1 and Appendix 4 of the "Fundamentally Different Factors Variance Application for Duke Energy Indiana, LLC – Edwardsport IGCC Station,"
d. Average daily flow rate for the sample collection date(s) for all analytical data provided in response to request number 1.

Response

Attached, please find a spreadsheet summarizing available flow data for the grey water treatment process, including maximum and average design flow rates, and the average daily flow rates corresponding to sample collection dates. Please note that these daily flow values have been derived from in-process meters intended to provide system operators with reasonably accurate information for the purpose of maintaining process water flows and balances within acceptable ranges. Though the process flow meters are periodically calibrated, individual daily values may include inaccuracies.

Request No. 3

For all data, provide a detailed description of how samples were collected and an annotated process flow diagram showing the sample collection location. Your submittal should include a description of the following sample identifiers included in your variance application:

a. "Filtered;"
b. "Influent;" and
c. "Effluent."

Response

Attached, please find an annotated process flow diagram showing grey water sample collection locations. As used in Duke Energy's FDF variance application, these terms have the following meanings:

a. "Filtered" means the Station service water, which is obtained from groundwater collector wells, then clarified and filtered, and transferred to the Service Water Tank prior to distribution for general Station use. The "filtered water" samples were collected at the Service Water Tank, far upstream of the grey water treatment system, for the purpose of determining source water concentrations of mercury, arsenic, selenium, and TDS.

b. "Influent" means the influent to the grey water treatment system, as measured at the grey water feed pumps.

c. "Effluent" means the effluent from the grey water treatment system, as measured at the final transfer pumps, which send the treated greywater either to the gasification cooling towers or to the Southeast Pond.

Wastewater samples reported in the FDF variance application were collected by grab sampling and were handled and analyzed in accordance with methods approved by EPA (i.e., published at 40 CFR part 136) for the specific parameter. In particular, mercury samples were collected using Method 1669 and analyzed using Method 1631E.

Request No. 4

EPA noticed in the data provided in Appendix 1 of the "Fundamentally Different Factors Variance Application for Duke Energy Indiana, LLC – Edwardsport IGCC Station," there was an order of magnitude increase in the effluent TDS concentration between the 10/8/2015 and the 10/13/2015 data. Additionally, both the influent arsenic and the influent mercury concentrations show an increase over the same time period. The data characteristics are indicative of atypical operations and may not represent normal operation of the gasification system and/or the wastewater treatment system. Absent information supporting that there were no indications of atypical operations from operational logs and monitoring equipment, EPA believes it may be appropriate to exclude these data as outliers. Should you believe these data do represent normal operation, please provide information supporting that conclusion.

Response

EPA has expressed concern, on the basis of an order of magnitude increase in the effluent concentration of TDS between the dates of 10/8/2015 and 10/13/2015 and lesser increases in influent arsenic and mercury concentrations between the same dates, that the data on 10/13/2015 are indicative of atypical operations of the gasification system and/or the wastewater treatment system at the Edwardsport IGCC Station. Consequently, EPA suggests that it may be appropriate to exclude the 10/13/2015 data as outliers unrepresentative of normal operation, absent information to the contrary.

Duke Energy respectfully disagrees with the tentative conclusions drawn by EPA from the referenced 10/13/2015 data for reasons that follow. Primarily, the disagreement with EPA is based on Duke Energy's perception and understanding that the variations in pollutant concentrations between these two successive sampling dates are rather routine for both effluent or influent of the grey water treatment system. Other than the increase in TDS effluent concentration between those dates, all other pollutant concentration variations, influent and effluent, are in the range of one standard deviation and do not warrant an inference of atypical or abnormal process or treatment operations. Even the increase in TDS effluent concentration is within the scope of a lognormal distribution.

Variability of Effluent and Influent Data for the Grey Water Treatment System. It is recognized that the effluent value of TDS on 10/13/2015 is substantially higher than other effluent values of TDS in the data set, exceeding them by factors ranging from 3.7 to more than 10. That said, it also can be observed that the effluent TDS concentration measured on 10/13/2015 appears to be near the periphery of a lognormal distribution. The concentration of 222 mg/l is slightly more than the sum of the mean and three standard deviations – 209.9 mg/l. However, even if it were appropriate to consider this singular value of TDS effluent as a potential outlier, such a characterization definitely would not be appropriate for the variations of the same period in effluent concentrations of mercury or arsenic. Furthermore, none of the influent concentrations for arsenic, mercury or TDS displays unusual variation.

The effluent concentration of mercury actually dropped from 5.79 ng/l to 3.05 ng/l between 10/8/2015 and 10/13/2015. The differential is less than the standard deviation for effluent data (3.72 ng/l for the date range of 9/8/2015 to 10/15/2015). The effluent concentration of arsenic on 10/13/2015 shows no measurable change from the effluent on 10/8/2015: both are < 1.0 ug/l.

Similar moderate variations occurred in the influent concentrations of all three pollutants between 10/8/2015 and 10/13/2015. For mercury, the influent concentration increased from 11.8 ng/l to 30.4 ng/l, a differential of 18.6 ng/l, which is only slightly greater than one standard deviation for this data set, which is 15.1 ng/l. Moreover, on three other occasions within this data set, larger variations occurred between the results from adjacent sampling dates. For arsenic, the influent concentration increased from 38 ug/l

to 210 ug/l between samples from 10/8/2015 and 10/13/2015, for a differential of 172 ug/l, which is less than the standard deviation of this data set of 284.2 ug/l. TDS influent increased between these two dates from 1,660 mg/l to 2,230 mg/l, a differential of 570 mg/l. This TDS influent concentration differential is about 1.5 times the standard deviation for this data set of 386.4 mg/l. In addition, it may be noted that the TDS concentration of 1,660 mg/l on 10/8/2015 is considerably below the mean concentration of 2,410 mg/l for this data set and the value of 2,230 mg/l on 10/13/2015 is still below the mean value.

So, based on an examination of the 10/8/2015 data and the 10/13/2015 data within the context of the entire data set from 9/8/2015 through 10/15/2015, Duke Energy believes that there is no basis for excluding any data from consideration in setting alternative ELG values for gasification wastewater. This conclusion is independent of the presence or lack of information concerning the operational normalcy of Edwardsport IGCC Station on 10/13/2015.

Contemporaneous Operational Information. For reasons explained above, Duke Energy believes that the variability between successive samples of influent or effluent for the grey water treatment system on 10/8/2015 and 10/13/2015 is rather routine and does not warrant an inference of atypical or abnormal process or treatment operations. Nonetheless, Duke Energy is not aware of information that would support a conclusion that the gasification process or the grey water treatment system was not operating in a normal manner on 10/13/2015.

As a final point, it should be noted that the Edwardsport IGCC grey water treatment process discharge (NPDES outfall 501) has been monitored only intermittently since the beginning of plant operations in mid-2013. The former version of the NPDES permit, effective 12/1/2010, required monitoring the internal outfall twice monthly upon IGCC start-up for a six-month period. The current version of the permit restored this regular monitoring, effective 4/1/2016. In all, there have been 14 months of required sampling of the grey water treatment system effluent, resulting in approximately 28 sampling events, since the commencement of operations. In contrast, there is a 29-month period between these intervals of regular monitoring in which no monitoring of the grey water treatment system effluent was required. Thus, required sampling periods represent only one-third of the operational history of the gasification and grey water treatment processes. Given the relative sparseness of the monitoring data and the fact that the gasification and grey water treatment processes are complex and operational experience with those processes is still limited, it is possible – and perhaps likely – that not all operating conditions for the IGCC plant within the range of normal variability are represented by the monitoring data. Consequently, absent certain knowledge to the contrary, Duke Energy believes it would be inappropriate to disregard any otherwise valid data as atypical – unrepresentative of the range of normal operations – on the basis of an unexpected result, or simply because that data is positioned on the upper bound of the available data set.

In conclusion, Duke Energy respectfully reiterates its request for approval of its FDF variance application. If you have further questions or would like to discuss the enclosed information, please contact me at 513-287-2268 or pat.coyle@duke-energy.com.

Sincerely,

Patrick Coyle

Patrick Coyle
Duke Energy – Environmental Services

Enclosures

cc: Paul Novak, IDEM OWQ, Permits Branch

Edwardsport Grey Water Treatment Analyses, 2013-2016

Note: Metals results represent the total recoverable metal unless otherwise indicated.

	Mercury (ng/l)							Arsenic (ug/l)			Selenium (ug/l)			TDS (mg/l)				Aluminum (mg/l)	Antimony (mg/l)	Barium (mg/l)	Beryllium (mg/l)
Sample date:	Filtered water	Influent	Concentrator Condensate	Crystallizer Steam Condensate	Barometric Condenser Condensate	Condensate Trim Cooler	Effluent	Filtered water	Influent	Effluent	Filtered water	Influent	Effluent	Filtered water	Grey Water Feed Tank (Influent)	Condensate Trim Cooler Discharge	Effluent	Effluent	Effluent	Effluent	Effluent
5/9/2013										< 0.06			7					0.003	< 0.00003	< 0.00003	< 0.00001
5/23/2013										< 0.06			< 0.2					0.008	< 0.00003	< 0.00003	< 0.00001
6/6/2013										< 6			< 0.2					0.011	< 0.00003	< 0.00003	< 0.00001
6/13/2013										< 6			< 0.2					0.006	< 0.00003	< 0.00003	< 0.00001
7/22/2013							2.08														
7/24/2013										2			4					0.009	< 0.00003	0.00200	< 0.00001
7/31/2013										< 0.6			< 0.2					0.061	0.01700	0.00300	< 0.00001
8/2/2013										< 0.6			< 0.2					0.295	0.00600	0.00300	< 0.00001
8/8/2013							9.58														
8/21/2013										15			< 10.0					0.020	< 0.01000	< 0.01000	< 0.01000
8/25/2013										15			< 0.2					0.020	< 0.00003	< 0.00003	< 0.00001
9/5/2013										< 0.06			< 0.2					0.016	< 0.00003	< 0.00003	< 0.00001
9/25/2013										< 0.06			< 0.2					0.040	< 0.00003	< 0.00003	< 0.00001
10/3/2013							2.53														
10/8/2013										< 0.6			< 0.2					0.028	< 0.00003	< 0.00003	< 0.00001
10/17/2013										< 0.6			< 0.2					0.057	< 0.00003	< 0.00003	< 0.00001
9/8/2015	0.540	6.55					12.8	< 1.0	1,100	< 1.0	< 1.0	260	< 1.0	300	2,540		20				
9/10/2015	< 0.50	15.8					5.25	< 1.0	120	< 1.0	< 1.0	160	< 1.0	300	3,020		40				
9/15/2015	< 0.50	10.8					10.3	< 2.0	120	< 2.0	< 2.0	320	< 2.0	120	2,560		< 10				
9/17/2015	< 0.50	21.2					6.55	< 2.0	130	< 2.0	< 2.0	130	< 2.0	280	2,090		20				
9/22/2015	< 0.50	22.0					10.8	< 1.0	31	< 1.0	< 1.0	78	< 1.0	324	2,200		10				
9/24/2015	< 0.50	23.4					11.5	< 1.0	63	< 1.0	< 1.0	87	< 1.0	322	2,140		< 10				
9/29/2015	< 0.50	44.4					6.40	< 1.0	67	< 1.0	< 1.0	66	< 1.0	420	2,700		32				
10/1/2015	< 0.50	7.35					3.92	< 1.0	42	< 1.0	< 1.0	80	< 1.0	336	2,980		20				
10/6/2015	< 0.50	15.6					2.40	< 1.0	33	< 1.0	< 1.0	140	< 1.0	340	2,680		20				
10/8/2015	< 0.50	11.8					5.79	< 1.0	38	< 1.0	< 1.0	160	10.0	380	1,660		14				
10/13/2015	< 0.50	30.4					3.05	< 1.0	210	< 1.0	< 1.0	140	< 1.0	320	2,230		222				
10/13/2015		0.694 (dissolved)					3.61 (dissolved)														
10/15/2015	< 0.50	59.5					0.877	< 1.0	230	< 1.0	< 1.0	110	< 1.0	340	2,120		60				
10/15/2015		0.694 (dissolved)					0.938 (dissolved)														
4/5/2016			7.03	< 0.50	3.31	15.60	4.74			< 1.0			2.9				34				
4/6/2016			7.25	< 0.50	1.34	16.30	8.39			< 1.0			4.1				72				
4/8/2016			1.72	0.59	1.15	8.88	3.09			< 1.0			3.8				42				
4/14/2016															586	1,760					
5/27/2016							17.8			< 1.0			14.2				< 10				
5/31/2016							4.46			< 1.0			< 1.0				< 10				
6/7/2016	< 0.50						1.51			< 1.0			< 1.0				24				
6/15/2016							< 0.50			< 1.0			< 1.0				< 10				
7/6/2016							3.53			< 1.0			1.1				< 10				
7/13/2016							1.44			< 1.0			1.3				< 10				
8/3/2016							< 0.50			< 1.0			< 1.0				< 10				
8/10/2016							4.07			< 1.0			7.2				< 10				
9/7/2016							2.05			< 1.0			1.5				< 10				
9/14/2016							0.78			< 1.0			< 1.0				< 10				
10/1/2016							1.79			< 1.0			1.0				30				
Maximum	**0.54**	**59.5**	**7.25**	**0.59**	**3.31**	**16.3**	**17.8**	**2.0**	**1,100**	**15**	**2**	**320**	**14.2**	**420**	**3,020**		**222**	**0.295**	**0.017**	**0.010**	**0.010**
Average	**< 0.5**	**22.4**	**5.3**	**< 0.5**	**1.9**	**13.6**	**5.1**	**1.2**	**182**	**1.9**	**1.2**	**144**	**2.3**	**315**	**2,270**		**29.6**	**0.0**	**0.0026**	**0.0014**	**0.0008**
Minimum	**< 0.5**	**6.6**	**1.7**	**< 0.5**	**1.2**	**8.9**	**< 0.5**	**< 1.0**	**31**	**< 0.1**	**< 1.0**	**66**	**< 0.2**	**120**	**586**		**< 10**	**0.0**	**< 0.00**	**< 0.0**	**< 0.00**
No. of results	**13**	**12**	**3**	**3**	**3**	**3**	**29**	**12**	**12**	**39**	**12**	**12**	**39**	**12**	**13**		**26**	**13**	**13**	**13**	**13**

Sample date:	Cadmium (mg/l)	Chloride (mg/l)	Chromium (mg/l)	Copper (mg/l)	Cyanide (mg/l)		Fluoride F (mg/l)	Iron (mg/l)	Lead (mg/l)	Manganese (mg/l)	NH3 as N (mg/l)	Nickel (mg/l)	Oil & Grease (mg/l)	pH (SU)	Phenol (mg/l)	Silver (mg/l)	TSS (mg/l)	Sulfate (mg/l)	Sulfide (as S) (mg/l)	Thallium (mg/l)	Zinc (mg/l)
	Effluent	Effluent	Effluent	Effluent	Total as CN, Effluent	Free, Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent
5/9/2013	< 0.00002	< 0.400	< 0.0004	< 0.00004	0.209	0.108	1.360	0.001	< 0.00002	< 0.00002	1.15	< 0.0002	< 0.90	7.30	< 0.001	< 0.00001	< 1.00	< 0.800	0.025	< 0.0003	0.010
5/23/2013	< 0.00002	< 0.400	< 0.0004	< 0.00004	0.505	0.340	0.880	0.004	< 0.00002	< 0.00002	1.14	< 0.0002	< 0.90	8.30	0.012	< 0.00001	< 1.00	0.800	0.095	< 0.0003	0.019
6/6/2013	< 0.00002	< 0.400	< 0.0004	0.003	0.845	0.798	0.071	0.007	< 0.00002	0.00500	0.76	0.0020	< 0.90	8.00	0.009	< 0.00001	< 1.00	0.400	13.400	< 0.0003	0.008
6/13/2013	< 0.00002	< 0.400	< 0.0004	0.003	0.210	< 0.001	0.599	0.011	< 0.00002	< 0.00002	1.14	0.0020	< 0.90	8.00	0.008	< 0.00001	< 1.00	< 0.100	0.163	< 0.0003	0.011
7/22/2013																					
7/24/2013	< 0.00002	0.120	< 0.0004	< 0.00004	3.750	3.060	0.240	0.016	0.00400	< 0.00002	1.27	0.0010	< 0.90	7.90	< 0.001	< 0.00001	< 1.00	0.600	6.300	0.0100	0.014
7/31/2013	< 0.00002	< 0.040	0.0010	< 0.00004	0.280	0.260	0.260	0.058	< 0.00002	0.00100	1.49	< 0.0002	< 0.90	8.40	0.084	< 0.00001	< 1.00	0.400	0.352	< 0.0003	0.018
8/2/2013	< 0.00002	< 0.040	< 0.0004	0.00100	0.250	0.243	0.270	0.012	< 0.00002	< 0.00002	1.10	< 0.0002	< 0.90	8.10	0.072	< 0.00001	< 1.00	1.000	0.654	< 0.0003	0.025
8/8/2013																					
8/21/2013	< 0.01000	< 0.070	< 0.0100	< 0.01000	0.880	0.868	0.050	0.043	0.03000	< 0.01000	1.05	< 0.0100	< 5.00		< 0.005	< 0.01000	< 4.00	0.456	1.580	0.0320	0.025
8/25/2013	< 0.00002	< 0.040	< 0.0004	< 0.00004	0.880	0.868	0.050	0.043	0.03000	< 0.00002	1.05	< 0.0002	< 0.90	7.50	< 0.001	< 0.00001	< 1.00	0.500	1.580	0.0320	0.025
9/5/2013	< 0.00002	< 0.040	< 0.0004	< 0.00004	0.250	0.229		0.054	< 0.00002	< 0.00002	0.85	< 0.0002	< 0.90	8.70	0.020	< 0.00001	< 1.00		3.450	< 0.0003	0.034
9/25/2013	< 0.00002	< 0.070	< 0.0004	< 0.00004	0.095	0.087	0.142	0.036	< 0.00002	< 0.00002	< 0.20	< 0.0002	< 0.90	9.50	0.009	< 0.00001	< 1.00	0.872	< 0.002	< 0.0003	0.038
10/3/2013																					
10/8/2013	< 0.00002	< 0.040	< 0.0004	< 0.00004	0.030	0.029	0.096	0.036	< 0.00002	< 0.00002	0.56	< 0.0002	< 0.90	6.70	0.012	< 0.00001	< 1.00	0.625	0.013	< 0.0003	0.039
10/17/2013	< 0.00002	< 0.040	< 0.0004	< 0.00004	0.200	0.191	0.071	0.013	< 0.00002	< 0.00002	1.52	< 0.0002	< 0.90	7.30	< 0.001	< 0.00001	< 1.00	< 0.078	0.803	< 0.0003	0.019
9/8/2015																					
9/10/2015																					
9/15/2015																					
9/17/2015																					
9/22/2015																					
9/24/2015																					
9/29/2015																					
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8/3/2016																					
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9/7/2016																					
9/14/2016																					
10/1/2016																					
Maximum	**0.01**	**0.4**	**0.01**	**0.01**	**3.75**	**3.06**	**1.36**	**0.058**	**0.03**	**0.01**	**1.52**	**0.01**	**5**	**9.5**	**0.084**	**0.01**	**4**	**1**	**13.4**	**0.032**	**0.039**
Average	**0.0**	**0.2**	**0.0**	**0.0**	**0.6**	**0.5**	**0.3**	**0.026**	**0.005**	**0.0**	**1.0**	**0.0**	**1.2**	**8.0**	**0.0**	**0.0**	**1.2**	**0.6**	**2.2**	**0.0**	**0.022**
Minimum	**< 0.0**	**< 0.0**	**< 0.0**	**< 0.0**	**0.030**	**< 0.001**	**0.1**	**0.001**	**< 0.00002**	**< 0.0**	**< 0.2**	**< 0.0002**	**< 0.9**	**6.7**	**< 0.0**	**< 0.0**	**< 1.0**	**< 0.1**	**< 0.002**	**< 0.0003**	**0.008**
No. of results	**13**	**13**	**13**	**13**	**13**	**13**	**12**	**13**	**13**	**13**	**13**	**13**	**13**	**12**	**13**	**13**	**13**	**12**	**13**	**13**	**13**

Grey Water Treatment System Flow Rates	Grey Water Treatment System Influent (gpm)	Concentrator Condensate (gpm)	Crystallizer Steam Condensate (gpm)	Crystallizer Process Condensate (gpm)	Barometric Condenser Condensate (gpm)	Condensate Trim Cooler (gpm)	Greywater Treatment System Effluent (gpm)
Maximum design flow rate:	(Not available)	20	(Not available)	42	9	857	746.5
Average design flow rate, 50%, 175 Deg:	(Not available)	20	(Not available)	25	6	516	(Not available)
Average daily rate, sample date: 5/9/2013	237	0	(Not measured)	0	700	192	56*
5/23/2013	256	0	-	0	700	331	250*
6/6/2013	451	0	-	0	900	369	354*
6/13/2013	336	0	-	448	750	25	229*
7/22/2013	240	0	-	1	700	260	245
7/24/2013	236	0	-	460	700	177	347*
7/31/2013	245	0	-	464	689	329	354*
8/2/2013	239	0	-	468	753	332	299*
8/8/2013	261	0	-	447	495	168	154
8/21/2013	270	0	-	440	698	389	369
8/25/2013	259	0	-	425	682	365	333*
9/5/2013	504	0	-	421	813	344	472*
9/25/2013	263	0	-	216	741	373	326*
10/3/2013	212	0	-	204	717	18	11
10/8/2013	262	0	-	201	554	382	299*
10/17/2013	356	0	-	381	581	510	493*
9/8/2015	413	0	-	366	608	436	458
9/10/2015	424	0	-	363	595	433	452
9/15/2015	415	0	-	366	589	431	427
9/17/2015	413	0	-	365	688	428	448
9/22/2015	416	0	-	364	797	434	430
9/24/2015	426	0	-	361	759	462	469
9/29/2015	412	0	-	336	811	438	433
10/1/2015	417	0	-	330	853	428	420
10/6/2015	413	0	-	336	889	439	425
10/8/2015	413	0	-	345	888	443	435
10/13/2015	383	0	-	106	905	409	411
10/15/2015	189	0	-	377	894	416	417
4/5/2016	228	0	-	332	877	407	390
4/6/2016	252	0	-	331	869	431	347*
4/8/2016	249	0	-	334	828	450	444
4/14/2016	262	0	-	328	692	424	412
5/27/2016	390	0	-	0	414	435	222*
5/31/2016	264	0	-	353	488	295	250*
6/7/2016	381	58	-	340	626	423	444*
6/15/2016	268	58	-	371	561	310	313*
7/6/2016	402	58	-	42	723	445	451*
7/13/2016	368	58	-	325	633	402	382*
8/3/2016	305	58	-	330	687	342	229*
8/10/2016	428	58	-	322	611	464	472*
9/7/2016	419	58	-	330	534	498	569*
9/14/2016	410	58	-	341	527	474	451*
10/1/2016	285	58	-	152	165	294	181*

Note: System effluent flow values in gpm marked with an asterisk (*) have been back-calculated from NPDES-reported MGD values.

Liquid
Vapor
LP Steam
Concentrator First and Second Stage Fans and Lube Oil Pumps 16-MA-150/151 16-MP-156 A/B
Concentrator Vapor Scrubber 16-MV-152
Caustic
Concentrator Vapor Scrubber Blowdown Pump 16-MP-152 A/B
P-200
Formate Crystallizer 16-MV-054
Formate Crystallizer Feed Tank 16-MT-054
Formate Crystallizer Feed Pumps 16-MP-060 A/B
Formate Crystallizer Heater 16-ME-054
Formate Crystallizer Recirc Pump 16-MP-058
Formate Pressure Filter Feed Pump 16-MP-059 A/B
Formate Pressure Filter and Filtrate Separator 16-ML-051 A/B 16-MV-057 A/B
Dumpster
Concentrator 16-MV-150
Concentrator Heater 16-ME-150
From Gasification
A
Grey Water Feed Tanks 16-MT-001 A/B
Grey Water Feed Pumps 16-MP-050 A/B/C
Concentrator Recirculation Pump 16-MP-150
Concentrator Condensate Flash Tank 16-MV-151
Acid
LP Steam
B
Concentrator Condensate Pumps 16-MP-151 A/B
Cold Crystallizer 16-MV-050
Cold Crystallizer Vapor Scrubber 16-MV-052
Cold Crystallizer Heater 16-ME-050
Cold Crystallizer Recirc Pump 16-MP-052
Vent to SRU
Barometric Condenser Condensate Cooler 16-ME-059
RO Reject Tank 16-MT-058
RO Reject Pumps 16-MP-065 A/B/C
Concentrator Product Pumps 16-MP-153 A/B
Cold Crystallizer Feed Tank 16-MT-052
Cold Crystallizer Feed Pumps 16-MP-051 A/B
Air Cooled Condenser 16-ME-051 Vacuum System 16-ME-052 16-ME-053
Barometric Condenser 16-ME-057
E
Acid
Barometric Condenser Pumps 16-MP-091 A/B
Barometric Condenser Coolers 16-ME-058 A/B
Crystallizer Process Condensate Tank 16-MV-053
D
-Cold Pressure Filter
-Formate Pressure Filter
-Cold Crystallizer
-Cold Vapor Scrubber
-Formate Crystallizer
Crystallizer Process Condensate Pumps 16-MP-057 A/B
Cold Pressure Filter Feed Pump 16-MP-054 A/B
Cold Pressure Filter and Filtrate Separator 16-ML-050 A/B 16-MV-056 A/B
Dumpster
Cold Pressure Filter Filtrate Tank 16-MT-053
Cold Pressure Filter Filtrate Pumps 16-MP-056 A/B
Crystallizer Steam Condensate Flash Tank 16-MV-051
C
Crystallizer Steam Condensate Pump 16-MP-053 A/B
Cold Crystallizer Vapor Scrubber Blowdown Pumps 16-MP-055 A/B
Air Cooled Condensate Cooler 16-ME-055
F
Condensate Trim Cooler 16-ME-056 A/B
RO Feed Tank 16-MT-055
RO Feed Pumps 16-MP-095 A/B/C
Acid
RO pH Adjustment Tank 16-MT-068
RO Feed pH Adjust Pumps 16-MP-066 A/B/C
First Pass RO Cartridge Filter 16-ML-054 A/B
First Pass RO Booster Pump 16-MP-154
First Pass RO 16-MW-150
Interstage Storage Tank 16-MT-059
SPRO Feed Pumps 16-MP-067 A/B/C
Second Pass RO Cartridge Filters 16-ML-055 A/B
Second Pass RO Booster Pump 16-MP-155
Second Pass RO 16-MW-151
RO Permeate Tank 16-MT-060
RO Permeate Pumps 16-MP-068 A/B/C
Caustic
Bleach
Acid
Primary Reaction Tank 16-MT-081
Secondary Reaction Tank 16-MT-082
Final Reaction Mix Tank 16-MT-083
Cyanide Destruct Product Pumps 16-MP-069 A/B
G
Cooling Tower 52-ME-001
SE Pond

A - Grey Water Treatment System Influent
B - Concentrator Condensate
C - Crystallizer Steam Condensate
D - Crystallizer Process Condensate
E - Barometric Condenser Condensate
F - Condensate Trim Cooler (Combined Condensate)
G - Final Grey Water Treatment Effluent (Outfall 501)